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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,358	10/24/2001	Tetsuroh Nakamura	5077-000070	6274
27572	7590	11/03/2004	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C.			NGUYEN, LAM S	
P.O. BOX 828			ART UNIT	
BLOOMFIELD HILLS, MI 48303			PAPER NUMBER	
			2853	

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/019,358

Applicant(s)

NAKAMURA ET AL.

Examiner

LAM S NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 5-6, 7/6, 8-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☒ Claim(s) 3-4, 7/4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION***Election/Restrictions***

In response to the election/restriction requirement, the applicants selected claims 1-4 and 7/4 for further prosecution. As a result, claims 5, 6, and 7/6 are withdrawn from consideration. Claims 8-22 were previously withdrawn from consideration.

Claim Objections

Claim 7/6 is objected to because of the following informalities: Claim 7/6 depends on claim 6, which has been withdrawn from consideration. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujio (JP 11179903) in view of Hiwada (US 6270193).

Fujio discloses an ink jet head, comprising a head body (*FIG. 6, element 10*) which is provided with a plurality of nozzles (*FIG. 6, element 17*) and a plurality of pressure chambers (*FIG. 6, element 12*) and actuators (*FIGs. 2, 6, element 80*) respectively corresponding to the nozzles, and a driver IC (*FIG. 6, element 140A*) for outputting driving signals for driving the actuators, wherein:

the actuators are arranged on a surface of the head body in a plurality of

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columns so as to form a plurality of actuator columns (*FIG. 2: There are two columns of actuators 80 disposed on the surface of the head body 10*);

signal input terminals of the actuators are arranged locally in a predetermined area in a central portion of the surface of the head body between the inner actuator columns (*FIG. 6: The signal connectors of two columns of the actuator 80 are located in the central area of the columns*);

the driver IC is provided with signal output terminals arranged so as to respectively correspond to the signal input terminals of the actuators (*FIG. 6, element 141*); and

the driver IC is mounted on the head body by face down bonding so that the signal output terminals and the signal input terminals are connected to each other (*FIG. 6: The driver IC 140A is mount of the head body 10 with face down so the connectors 141 can be connected to the signal terminals of the actuators 80 through the connections 130*).

Fujio does not disclose wherein the driver IC is mounted on the head body by being directly attached thereto and is silent wherein each of the actuator columns extends in a direction perpendicular to a scanning direction, and the signal input terminals of the actuators are arranged in a direction perpendicular to the scanning direction on the surface of the head body in a central portion thereof with respect to the scanning direction **(Referring to claim 2)**.

Hiwada discloses an ink jet recording head having a main head body including ink chambers, piezoelectric elements, and an IC chip for driving the piezoelectric elements (*Abstract*), wherein the IC chip (*FIG.13A-D, element 60*) is directly attached to

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the surface 21f of the head body 21 in an integrated manner by the aid of the conductive adhesive 65 so that signal output terminals 62-63 of the IC chip 60 and signal input terminals 68-69 of the head body 21 are connected to each other (*FIG. 13A-D and column 11, lines 15-20*), and wherein the actuator columns (*FIG. 4*) and the signal terminal column (*FIG. 5, element 69*) are arranged in a direction that is perpendicular to either the main or sub scanning direction.

Therefore, it would have obvious for one having ordinary skill in the art at the time the invention was made to modify the printhead disclosed by Fujio such as directly attaching the driver IC chip on the surface of the head body as disclosed by Hiwada. The motivation of doing so is that the IC chip can be subjected to forced liquid cooling by using the ink contained in the head to improve the radiation efficiency in order to prevent the chip from thermal destruction due to overheating of the IC chip as taught by Hiwada (*Column 10, lines 35-45*).

Allowable Subject Matter

Claims 3-4, 7/4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The primary reasons for the indication of the allowability of claim 3 is the inclusions therein, in combination as currently claimed, of the limitation that the actuators of each outer actuator column and the signal input terminals thereof are connected to each other by signal lines passing between actuators of one of the central actuator columns is neither disclosed nor taught by the cited prior art of record, alone or in combination.

Claims 4 and 7/4 are allowed because they depend directly/indirectly on claim 3.

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Response to Arguments

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN
10/30/2004



Stephen D. Meier
Primary Examiner